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RED TURPENTINE BEETLE

in the

OGONTZ SEED PRODUCTION AREA

Rapid River District, Hiawatha National Forest

October, 1966

Prepared by R. F. Fowler

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by

Richard F. Fowler

Zone Entomologist

I. Introduction

The red turpentine beetle (Dendroctonus valens Lec.) is a widely distributed bark beetle. It has been observed in various parts of the Upper Peninsula of Michigan, but causing only minor damage. In this case, however, it is a serious threat to the highly valued red pine seed production area.

The outbreak was discovered September 15, 1966, by Mr. Spar Sager, T. M. Technician on the Hiawatha N. F. The zone entomologist was notified, and he surveyed the area September 19, 1966. The external signs of attack were quite evident and easy to identify by close observation of the basal two feet of the bole of the tree. One gallery was dissected, and an adult beetle found and identified.

The survey was conducted by walking a horseshoe-shaped course through the area and examining the closest tree to the line. In addition, all the trees in one area were examined (See Table I). The number of attacks were recorded by counting the pitch tubes and piles of borings on the ground and stuck to the bark.

It is important to note that this area was burned in the Spring of 1966 as a test in the control of cone beetles. This burn, although called "light" by the foresters on the scene, is suspected to have weakened the trees, predisposing them to attack. The S.P.A. on the Soo District has received the same treatment in thinning, pruning, etc., but has not been burned; and to date no red turpentine beetle has been found.

The biological control by parasites and disease is not understood. Because of this and the high value of each individual tree, control by chemical means is recommended.

II. Technical Information

A. Causal Agent

Red Turpentine Beetle, Dendroctonus valens Lec.

B. Host Tree

Red Pine, Pinus resinosa Ait.

C. Type of Damage

The beetles usually attack the basal portion of the bole. They bore through the bark of the tree and mine out galleries between the bark and the wood. Tree killing can result directly from the attack, but more usually the tree is weakened and subject to attack by other insects, notably Ips spp. Ips spp. are known to be in this area, but none were noted in the trees attacked by the red turpentine beetles.

Seed production is the primary function of this area. Fowells (1965) notes that unthrifty trees produce about fifty cones; whereas, average trees produce about four times as many cones.

D. Biological Data

The effectiveness of parasites, predators and diseases are not understood, nor have they been closely studied (Smith 1961). No attempt was made to study this in the present case, as carving into the trees to expose the galleries would be extremely detrimental to the tree.

The population of turpentine beetles was ascertained by walking a horseshoe-shaped line through the seed production area and examining the closest trees to this line. In addition, all the trees were examined within the triangular area formed by the roads and the edge of the area. Each sample tree was examined for pitch tubes and piles of borings and pitch pellets on the ground. The number of attacks per tree is recorded by tree number on Table One.

The survey showed that 41 trees, or 22%, of the 185 trees examined were infested. Twenty-seven per cent of the 100% surveyed triangular area was infested, and 17% of the cruise line area was infested. In addition, 13 trees or 32% of the 41 infested trees showed evidence of being attacked more than once.

E. Physical Data

Trees that are in a weakened condition are more prone to attack. Fire is the first factor to be considered here. This area was burned the Spring of 1966 as a test for control of cone beetles. The fire was described by the foresters as "light", but the lower trunks of most of the trees are scorched.

Drought also reduces tree vigor. This past summer this area experienced the worst drought since the mid-1930's. An extended period of unusually hot weather was also recorded. The combination of the fire and the drought appears to be responsible for the condition. The S.P.A. on the Soo District was not burned; and, although it underwent a hot dry summer, the resumption of rains occurred sooner than on the Ogontz S.P.A.

The Ogontz S.P.A. is struck by lightning rather consistently, killing individual trees. One of these lightning-killed trees was examined and found to be infested with turpentine beetles.

F. Location and Extent of the Outbreak

The outbreak is in the Ogontz Seed Production Area located in the SE¼ of Section 15, T41N, R20W Michigan Meridian. This S.P.A. consists of about twenty acres of red pine on the Rapid River District of the Hiawatha N. F. (See enclosed map.)

II. Discussion and Recommendations

The seed production area is a stand of high value red pine intensively managed for cone production. The red turpentine beetle poses a threat to each individual tree directly by killing it or indirectly by weakening it and thus making it more vulnerable to attack by other insects, notably Ips spp., and disease. The effects of parasites and predators on the red turpentine beetle are not known, but these are probably quite limited; since this beetle is protected under the bark during most of its life cycle.

Control of the red turpentine beetle is judged to be relatively easy and effective. There has been little need for control in the past, but the closely related black turpentine beetle has been checked successfully. The control for red and black turpentine beetles should be the same, since the habits are the same.

Lindane at 1% in fuel oil is effective against the black turpentine beetle and is recommended against the red beetle. The procedure requires spraying the trunk of each individual tree with the solution to the point of run-off. This can be done with a back-pack sprayer, as the basal two feet of each tree is to be covered. This type of individual spraying is naturally rather expensive, but the high value of the area will outweigh the cost. The cost for this project is estimated to be about ten dollars per acre or $200 for the Ogontz S.P.A. The Lindane penetrates the bark and kills the beetles in their galleries. Since flight occurs with the first warm days of Spring, the control measures must be carried out this Fall.

1. Control by chemical means should be undertaken this Fall.

2. The area should be examined several times a year, and lightning strikes and other fading trees should be promptly removed.

FINAL FOREST RECOMMENDATION

1. Control the outbreak with Lindane this Fall to prevent spread of the insect and to prevent further damage to the already infested trees by continued feeding within them.

2. Examine the area frequently for signs of activity by this insect and other insects and disease.

3. Remove fading and windthrown trees immediately upon being discovered to prevent buildup of red turpentine beetles and bark beetles.

Literature Cited

Fowells, H. A. 1965. Silvics of Forest Trees of the United States. USDA Forest Service Agric. Handbook 271. 432-446.

Smith, Richard H. 1961. Red Turpentine Beetle. USDA Forest Service Forest Pest Leaflet 55. 8pp.

APPENDIX 7

TALLY SHEET

Red Turpentine Beetle
Ogontz S.P.A.

R. Fowler
9/19/66

Tree No.	Number of Beetles	Tree No.	Number of Beetles	Tree No.	Number of Beetles
19	0	267	1	316	0
21	0	268	0	317	0
22	0	269	1	318	0
25	0	270	0	319	0
34	0	271	0	320	0
35	0	272	0	321	0
37	0	273	0	322	0
52	0	274	0	323	1
53	0	275	1	324	1
87	0	276	0	325	0
88	0	277	0	326	0
89	0	278	0	327	0
90	0	279	0	328	0
113	0	280	0	329	0
114	0	281	0	330	0
121	0	282	1	331	0
122	0	283	0	332	0
123	0	284	0	333	0
124	0	285	1	334	0
127	0	286	0	336	0
128	1	287	1	337	0
131	0	288	0	339	0
138	0	289	1	340	0
139	0	290	0	342	0
140	0	292	0	343	0
141	0	293	0	344	0
143	0	294	1	345	0
144	0	295	0	347	0
145	0	296	0	348	0
179	2	298	0	349	0
194	1	300	0	350	0
195	0	301	1	352	0
196	0	302	0	353	0
197	0	303	2	354	0
200	0	304	0	355	0
227	3	305	1	356	1
228	2	306	3	357	1
231	0	307	0	358	0
233	0	308	0	359	0
252	2	309	3	360	0
253	0	310	0	361	3
255	0	311	3	362	4
257	2	312	0	363	0
258	0	313	1	364	0
260	0	314	0	365	1
266	1	315	0	366	0

APPENDIX

TALLY SHEET

Red Turpentine Beetle
Ogontz S.P.A.

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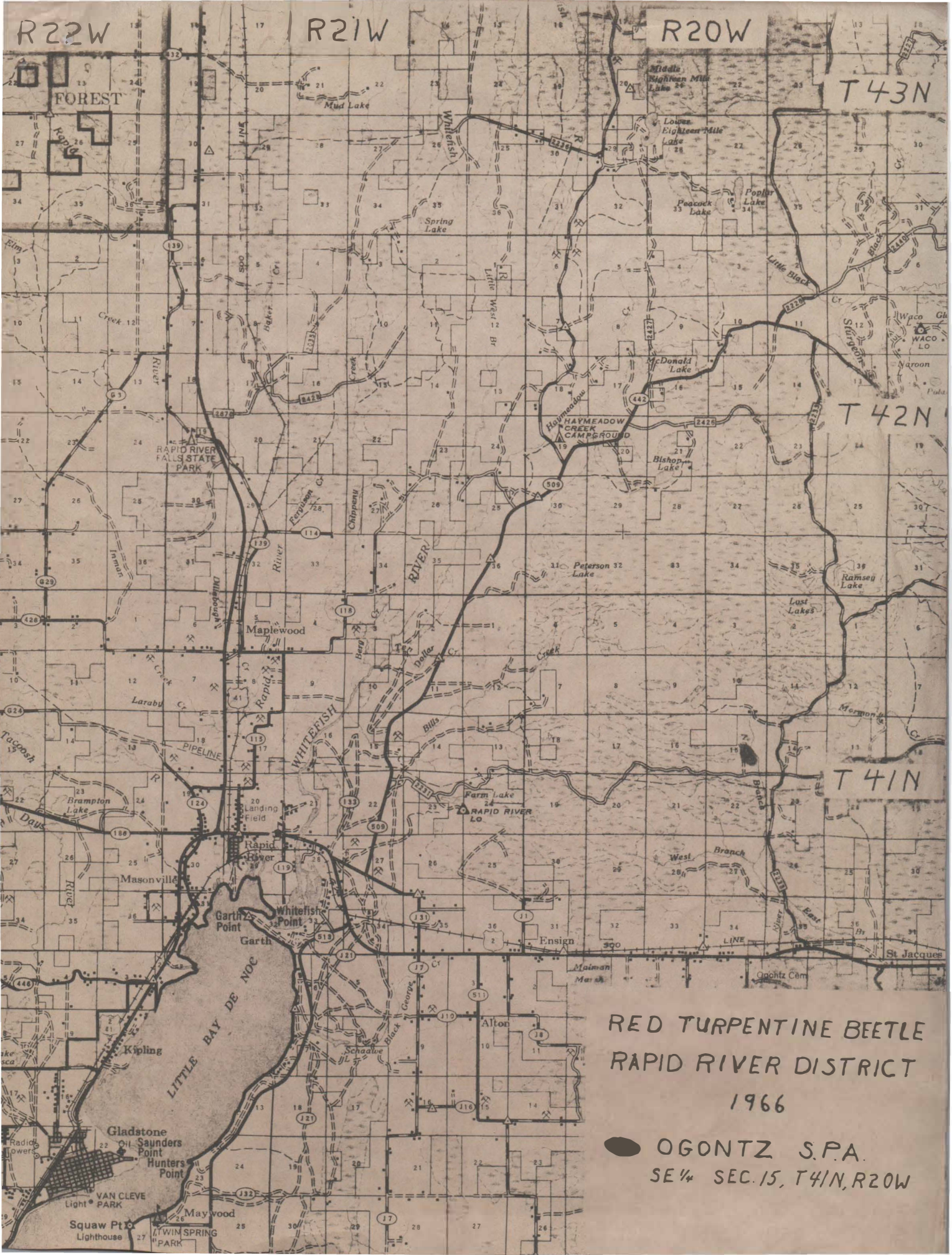
9/19/66

Tree No.	Number of Beetles	Tree No.	Number of Beetles
367	0	574	0
368	0	575	0
369	1	581	1
370	1	592	0
371	1	594	0
422	1	595	0
457	0	601	0
472	0	603	0
474	0	612	0
475	0	613	0
497	0	627	0
498	1	628	0
508	0	629	0
511	0	631	0
516	0	632	0
531	3	633	0
532	0	647	0
536	0	655	0
545	0	657	3
546	1	667	0
552	1	672	1
555	0	685	0
570	0	686	0
573	0		

Total Trees examined -- 185
Total Infested -------- 41
Per Cent Infested ----- 31%


R22W
R21W
R20W
T43N
T42N
T41N
FOREST
Mud Lake
Middle Eighteen Mile Lake
Lower Eighteen Mile Lake
Peacock Lake
Poplar Lake
Spring Lake
Little Black
Waco L.
WACO LO
McDonald Lake
HAYMEADOW CREEK CAMPGROUND
Haymeadow Cr.
Bishop Lake
RAPID RIVER FALLS STATE PARK
Ferguson Cr.
Chippeny Cr.
Peterson Lake
Ramsey Lake
Lost Lakes
Maplewood
Rapid River
WHITEFISH RIVER
Bills Cr.
Brampton Lake
Landing Field
Farm Lake
RAPID RIVER LO
Rapid River
Masonville
Whitefish Point
Garth Point
Garth
Ensign
St Jacques
Ogontz Cem
LITTLE BAY DE NOC
Kipling
Alton
Schaalwe L.
Gladstone
Oil
Saunders Point
Hunters Point
Radio Towers
VAN CLEVE PARK
Light
Maywood
Squaw Pt
Lighthouse
TWIN SPRING PARK
PIPELINE
LINE
RED TURPENTINE BEETLE
RAPID RIVER DISTRICT
1966
OGONTZ S.P.A.
SE¼ SEC. 15, T41N, R20W